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UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

1966 ANNUAL REPORT

PRIEST RIVER EXPERIMENTAL FOREST

PRIEST RIVER, IDAHO

by

Calvin C. Carpenter

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Memorandum

INTERMOUNTAIN FOREST & RANGE EXPERIMENT STATION
FOREST INSECTS LABORATORY
P. O. BOX 469
MOSCOW, IDAHO 83843

4060 PREF

TO : C. A. Wellner, Ass't. Director, INT, Ogden

DATE: May 19, 1967

FROM : Glenn H. Deitschman, Project Leader,

SUBJECT: Research Facilities

In reply to your memo on the 1966 Annual Report for Priest River, thanks for bringing the mis-identification of Lyon and Stickney to our attention. Answers to your questions are outlined below.

Page 6. The SCS cooperation referred to is in acknowledgment of the equipment that they supply.

page 9. Cut-volumes for the 1963 Benton Creek Sale were quite close to appraisal estimates. The estimated volumes are given on p. 17 of the 1962-63 annual report.

Page 15. Joslyn Pole Company provided snow vehicle transportation at a time when ours had broken down, reportedly as a favor in return for our letting them use the Experimental Forest headquarters area for parking their snow vehicles, during the winter poling operation.

cc:Carpenter

RECEIVED
MAY 24 1967
Intermountain Forest &
Range Experiment Station

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

Glenn H. Deitschman, Principal Silviculturist
Moscow

4060 PREF
May 16, 1967

Charles A. Wellner, Assistant Director

Research Facilities

Thanks for Cal Carpenter's good 1966 report on the Priest River Experimental Forest. I noticed one small error in the third paragraph on page 3 that you may wish to correct in your copies. Jack Lyon and Peter Stickney are from Project 1802 of the Intermountain Station in Missoula.

A few questions:

Page 6. When did the SCS start cooperating on the snow surveys?

Page 9. How did the cut volumes on the Benton Creek--11/18/63--Hedlund Lumber Company compare with estimated volumes in the appraisal?

Page 15. Why did Joslyn Pole Company provide assistance for measurement of the Benton Spring snowcourse, and other field installations?

CAWellner:ls

CHARLES A. WELLNER

1380
April 25, 1967

1966 ANNUAL REPORT

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by

Calvin L. Carpenter

Intermountain Forest and Range Experiment Station
Ogden, Utah

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1966 ANNUAL REPORT

Progress in research activity and improved planning for future research characterized the year 1966 at Priest River Experimental Forest. Major activities included further improvements and advanced techniques in the study of the intensive watershed research program, a highly concentrated mycological study of the basidiomycetes, the continued follow-up on major management guidelines, and the initiation of a Forest Wildlife Habitat research study.

The following report summarizes the activities for the 55th year of operation.

RESEARCH ACTIVITIES

TIMBER MANAGEMENT RESEARCH

Thinning PREF Transect

The north exposure of the transect was marked for thinning in 1966. The area includes approximately fifteen acres from the top of south ridge to Benton Creek bottom. Four species, including mixtures, and two density levels are included in the treatments (figure 1). A contract was awarded to K & M and Associates, Fenn, Idaho, on September 19, 1966, for $1,365.00. When the thinning project is completed in 1967, the marked plots will also be useful for demonstration purposes.

Vigor-Quality Outplantings

Plot 212 was maintained by R. J. Steinhoff and the experimental forest superintendent. Measurements on this study are being continued to determine the heritability of vigor and quality traits in white pine rust-resistant progeny.

Lodgepole Pine-Jack Pine Hybrids

Plot 199 was remeasured by Jim Lotan and Charles Hatch, Forestry Sciences Laboratory, Bozeman. This work includes a series of field tests to determine if the hybrid is (1) suited to the climate and soils of the area, and (2) superior to native lodgepole pine.

Site-Productivity Evaluation

Permanent plots 101, 112, and 113 were reexamined in detail by Robert Pfister. Measurement of understory vegetation, soil profile descriptions and stem analyses of dominant white pines were conducted as preliminary work in a study attempting to relate vegetation and site factors to productivity within the western white pine type.

WATERSHED MANAGEMENT RESEARCH

Benton Creek Model Watershed

Project 1601 continued expansion of its activities in Benton Creek drainage. Future research in two categories--(1) plot studies and (2) small watershed evaluation--will be carried on. Three new towers were constructed and set up, one at old station site #39 (4000 feet), one at old station site #29 (3700 feet), and the other at a new location #35 (3700 feet). Three new snowmelt gages were activated at the above-mentioned sites, and three new snow courses were established and marked

Figure 1.--Transect thinning map, 1966.

in sub-watersheds No. 4 and 5. These new courses located at different elevations in each subdrainage will be measured and mapped weekly. Two new A-frame structures were set up; one for use in instrumentation at the snow-interception site and the other for a warming hut to be used by personnel performing extensive field work during the winter season.

Snow Interception. Cooperative Study with W.S.U.

This study was initiated in 1965 by Dr. Don Satterlund, Washington State University, and W.M.R. project 1601 to develop and test methods for determining snow interception by different coniferous species and to calculate seasonal amounts of snow interception in pure and mixed stands. The study is continuing through the 1966-67 winter season with improved instrumentation techniques.

FOREST WILDLIFE HABITAT RESEARCH

Jack Lyon and Peter Stickney of the ~~Regional office~~ Intermountain Station, Missoula, Montana, established twelve permanent transects in five areas within the lower Benton Creek timber sale, which is to be logged and burned. These transects will provide the base information for studies of the effects of logging and burning on wildlife habitat. After logging, relocation and measurements of the vegetation will be made at periodic intervals. The pre-logging survey will give information on what was available for wildlife before logging, and will provide some standard for judging potential development. The post-logging survey will reveal actual changes and the effect of variations in treatment, particularly fire quality, on the way such vegetation develops.

FOREST DISEASE

Pole Blight

The three pole blight induction plots were maintained, and soil moisture samples were collected in June and September, 1966.

Dwarfmistletoe

Ed Wicker continued work on the field plot established in 1961 to study host specificity and age susceptibility of dwarfmistletoe on several tree species. The plot was examined in the spring of 1966 to determine amount of dwarfmistletoe seed removal by snow, and the number of successful infections. Seedlings were reinoculated with several species and varieties of dwarfmistletoe seed.

An area, approximately 200' x 100', located at the nursery site was prepared for planting in the spring of 1967 by the Forest Disease Research project.

Collection and Study of Fungi

During the fall of 1966, an intensive study of the local fungi was carried on in northern Idaho. The Experimental Forest was used as a headquarters for this purpose. The following mycologists stayed at the Forest for varying periods and participated in field studies during the season:

Dr. and Mrs. Alexander H. Smith, University of Michigan

Dr. Harry Thiers, San Francisco State College

Dr. Orson Miller, Forest Disease Laboratory, Laurel, Maryland

Dr. Roy Watling, Royal Botanical Gardens, Edinburgh, Scotland

Dr. Ronald Peterson, University of Tennessee

Mr. Kenneth Harrison, Nova Scotia, Canada

Mr. Samuel Mazzer, Ann Arbor, Michigan

Mr. Larry Grand, Washington State University

There were several visitations made by research groups, educators, and hobby collectors, traveling from many parts of the northwest and Canada.

Due to extremely dry conditions during the summer season, added effort had to be exercised in making collections, but despite this hindrance, the mycologists considered their efforts here profitable. The material and cultures obtained will be of direct use in several studies underway at the Forest Disease Laboratory in Laurel, Maryland, as well as at several noted educational centers--national and international. A great deal of knowledge is being gained in regard to forest fungi and the biological role which they play in forest stands.

FOREST INFLUENCES

Control Weather Station

The continuous weather records were maintained for the 55th consecutive year. Weekly and monthly weather records were provided for the Priest River Times, a practice which has been faithfully carried on for several years. A summary for the year 1966 and "normal" figures are shown in Table 1.

Table 1.--Weather summary for 1966 (control station).

Month	Precipitation		Temperature			
			Average maximum		Average minimum	
	Normal*	1966	Normal*	1966	Normal*	1966
	- - - inches - -		- - - - - - - - - °F. - - - - - - - - -			
January	4.02	5.19	30.3	32.1	16.6	23.4
February	3.09	0.98	36.9	38.1	18.3	23.3
March	2.65	4.80	45.3	45.3	23.5	24.6
April	2.00	0.54	57.6	55.5	29.6	29.8
May	2.18	1.46	66.7	68.0	36.6	37.0
June	2.27	4.09	73.5	67.8	42.5	41.7
July	0.89	1.15	83.1	80.5	45.5	45.9
August	1.04	0.92	80.2	81.0	43.4	43.0
September	1.67	0.31	70.9	76.8	37.8	42.4
October	2.96	1.61	56.6	55.2	32.1	32.9
November	3.76	6.65	39.6	39.3	26.7	28.9
December	4.37	6.51	32.5	34.2	21.1	28.7
Annual	30.90	34.21	56.2	56.2	31.0	33.5

* Normal reflects 50-year average (1912-1961).

Precipitation

Precipitation records were maintained throughout the year at the following locations: (1) control weather station; (2) Benton Dam; and (3) Benton Spring. The recorders at the control station and Benton Dam are recording rain gages (serviced weekly). The Benton Spring Sacramento storage gage is measured monthly. Monthly precipitation at these three stations for 1966 is presented in Table 2.

Snow Survey

In cooperation with the Soil Conservation Service, Benton Spring and Benton Meadow snow courses were measured monthly from January through May in 1966. The resulting data are presented in Table 3. The Benton Spring snowcourse measurements also contribute importantly to the watershed research project. Additional weekly measurements were made throughout the entire snowmelt season for the benefit of the Watershed Management Research project.

Other Climatic Stations

During the past year, modifications and new installations were set up in connection with the Watershed Management Research project. These are described under that heading.

Table 2.--Monthly precipitation at three stations on Benton Creek, 1966.

Month	Control (Elev. 2344')		Benton Dam (Elev. 2640')		Benton Spring (Elev. 4700')	
	Normal*	1966	Normal*	1966	Normal*	1966
	inches					
January	3.45	5.19	4.47	6.66	3.31	4.70
February	2.68	0.98	2.88	1.47	2.91	0.60
March	3.22	4.80	3.45	4.37	3.92	5.50
April	1.99	0.54	2.22	0.65	2.81	1.40
May	2.83	1.46	2.93	1.33	3.64	2.60
June	1.95	4.09	2.16	4.19	2.30	4.00
July	0.84	1.15	0.85	1.22	1.02	0.60
August	1.50	0.92	1.80	1.45	1.85	1.20
September	1.38	0.31	1.32	0.31	1.24	0.34
October	2.14	1.61	1.99	1.32	2.24	1.65
November	5.74	6.65	5.95	6.82	5.91	4.81
December	4.58	6.51	5.30	6.83	5.54	7.80
Annual	32.30	34.21	35.32	36.62	36.69	35.20

* Based on 7-year average (1960-1966) because Benton Spring rain gage records began in 1960.

Table 3.--Snow depth and water content, 1966.

Month	Normal*		1966	
	Snow depth	Water content	Snow depth	Water content
	inches			
Benton Meadow (Elev. 2344')				
January 1	12.0	2.7	27.9	5.1
February 1	19.4	4.8	23.7	6.7
March 1	19.3	6.0	28.4	7.6
April 1	6.2	2.3	8.0	2.8
May 1	0.0	0.0	0.0	0.0
Benton Spring (Elev. 4775')				
January 1	30.9	8.4	39.0	9.1
February 1	46.8	13.7	45.9	14.3
March 1	55.3	18.4	48.2	16.5
April 1	55.6	20.4	47.5	19.0
May 1	34.0	14.8	28.2	11.9

* Based on 27-year average (1937-1963).

ADMINISTRATIVE ACTIVITIES

FIRE PROTECTION

The fire plan was reviewed and declared satisfactory. It contains the applicable portion of the Falls District plan, outlines the Experimental Forest responsibilities, and provides an action plan for the headquarters area.

FOREST ROADS

New Construction

No new roads were completed in 1966. Hedlund Lumber Company began road-building on the Lower Benton Creek Sale in December. Roads J2, J3, J4, K3, N2, N3, and N4 will be built as part of this sale.

Reconstruction and Maintenance

Work in connection with the Lower Benton Creek Sale began in December, 1966. Portions of roads 597-B and 597-C will be reconstructed.

The Kaniksu National Forest performed maintenance on roads P-1, I-4, M-2, the upper part of B and the lower part of A during 1966.

TIMBER SALES

Benton Creek--11/18/63--Hedlund Lumber Company

This timber sale was described in the 1962-1963 annual report. Logging was completed late in 1966 and the sale will be closed after roads are maintained and inspection completed this spring. Slashing will be contracted this summer and the clearcut areas will be broadcast-burned in the fall of 1968.

The final report listed total volumes removed as follows:

Species	Volume (MBM)
WWP	1,176.62
WL-DF	1,156.26
ES	204.52
WRC	524.00
WH-GF	901.07
WRC poles (B.M. equiv.)	104.00
Total	4,066.47

Lower Canyon Creek--5/25/65--Ron MacDonald

This timber sale was described in the 1964-1965 annual report. An extension has been granted to 12/31/67. Slashing will be contracted early in 1968 so the clearcut area can be burned in the fall of 1968.

Lower Benton Creek--11/28/66--Hedlund Lumber Company

This timber sale was made to clearcut and regenerate mature timber on 112 acres, in accordance with the objectives of the management plan for the Experimental Forest. Reconstruction is required on 2.40 miles of main access roads (B and C), and 2.51 miles of new roads (J-2,3,4, K-3, N-2,3,4) are to be constructed.

The estimated volume and bid stumpage rates were:

Species	Volume (MBM)	Stumpage ($/M)	Slash ($/M)
WWP	330	38.26	1.25
PP	140	17.90	1.25
L-DF	940	19.03	1.25
LPP	10	14.76	1.25
WRC	460	13.87	1.25
H-GF	585	13.25	1.25
	2,465		

IMPROVEMENTS AND MAINTENANCE

Water System

Due to a malfunction in the electronic control, the operation of the system was in constant need of attention. In May of 1966, the original control was replaced, and with minor wiring changes has proven very satisfactory.

Water samples taken the first day of June and January have revealed no contamination.

Sewer System

The entire system is operating satisfactorily.

Fire Behavior Experimental Area

Entire perimeter fence was rebuilt, with old wire replaced by new along 75 percent of its length. The old fence had been damaged by heavy snowfall and deer.

Headquarters Area

A mercury vapor, 20,000 lumen light was installed in March, 1966.

All of the lawns were fertilized in May, 1966.

All trees on the headquarters grounds were pruned. Hose shelters, hydrants, guardrails, marker posts, fire extinguisher shelters, and sand barrels were painted during the summer season.

A new mailbox and supporting post were installed at the main entry October, 1966.

Two signs on the entrance road were restained and painted.

The anemometer pole was replaced at the Fire Weather Station.

Building Maintenance

A brief summary of the work done in 1966 by individual buildings follows:

A. Office.--The exterior was stained with F.P.L. cedar stain. The entire interior of the furnace room and the basement hall floor were painted. The chimney flashing and the vent pipe were repaired.

B. Bunkhouse-Mess Hall.--The freeze damage which occurred in the winter season of 1964-1965 was repaired, and the building was reactivated in August 1966. The revamping job included replacement of all breakage in pipes and fittings from the crawlway under the building to the second floor shower room. This necessitated removal and replacement of flooring, laying linoleum, and two complete toilet installations in the washroom. A new 80-gallon hot water heater was installed.

C. Cottage #1.--The exterior was stained and the two outside screen doors were rebuilt.

D. Cottage #3.--The entire basement area was given an application of paint and varnish. The stairwell wall was repaired and painted, including varnish of all trim. A new enameled aluminum roof was

installed during the summer. The wood trim in the bathroom was redone, and new aluminum storm windows were installed.

E. Cottage #4.--A new enameled aluminum roof was installed during the summer. Paint was applied to the interiors of the kitchen, living room, and bath. Outside doors were repaired.

F. Oil House.--Shingle stain was applied, a new base for the gas pump was built, and a shelter was erected over the pump.

G. Regular monthly checks were made on all installations, including water supply. At times when weather conditions changed abruptly, special inspections were made.

PERSONNEL

Local Employees

Position	Dates	Names
Superintendent	1/30/65-present	Calvin Carpenter
Forestry Aid	8/19/64-present	Bud Jeffers
Maintenance Man	Intermittent	Steven Booth
Maintenance Woman	Intermittent	Jane Knoke

Bud Jeffers served as part-time maintenance man, and assisted on the watershed research project until 5/8/65. At this time he received his permanent appointment with Watershed Management Research as Forestry Aid, and is now working full-time for that unit.

Steven Booth, a junior attending Priest River High School, did a commendable job in assisting with the general maintenance of the Experimental Forest.

Jane Knoke very capably undertook janitorial duties during the summer season.

Excluding the time of the above-named individuals, Station personnel worked a total of 322 man-days on the Forest.

INSPECTIONS

April 22, 1966 - Inspection of control weather station precipitation gage by Howard Kappes, U. S. Weather Bureau, Boise.

June 21, 1966 - Inspection of fire weather station by Robert R. Peterson, U. S. Weather Bureau, Missoula.

July 8, 1966 - Inspection of Watershed Management Research field installations by Herb Story (WO), Otis Copeland (Ogden), and Harold Haupt (Moscow).

August 1, 1966 - Inspection of control weather station precipitation gage and instruments by Howard Kappes, U. S. Weather Bureau, Boise. Recharged Sacramento rain gage at Benton Spring.

September 2, 1966 - Inspection of control weather station by D. J. Stevlingson, Boise.

October 26, 1966 - Inspection of control weather station and Benton Dam precipitation gage by Howard Kappes, U. S. Weather Bureau, Boise.

OFFICIAL VISITORS

Many groups and individuals used the Experimental Forest during 1966. Following is a chronological listing of visitors who used the forest for research or educational purposes. (Intermountain Station personnel conducting research are not included.)

Dates	Visitors	Purpose of Visit
Jan.-April	Dr. Don Satterlund, Boyd Hill, W.S.U.	Periodic supervisory visitations in connection with snow interception studies.
May 21	Dr. R. Daubenmire and 19 students in field ecology class, W.S.U.	Field observation of ecological communities and research activities at PREF.
May 24-27	J.J. Armstrong, RO, Missoula J. Tietz , ", " S. Skousen , ", " W. Markham , ", "	Installation of control points prior to aerial photography of the Forest.

Dates	Visitors	Purpose of Visit
June 8-10	Dr. J. A. Schenk, J. Gosz, and S. Hammond, University of Idaho	Studying estimation of cone crops in young Douglas-fir.
July 10	Dr. C. W. Wang, Donald L. Gayman, Mojilewi Rakman, University of Idaho	Data collection from ponderosa pine racial variation plots.
August 15-20	Dr. R. Daubenmire, W.S.U.	Field work on semi-permanent field plots at PREF.
August 16-17	Arthur Brackebusch, NFFL Athol Hodgson, Melbourne, Australia	Tour and study of research methods in progress at PREF.
Sept. 2-25	Larry Grand, W.S.U.	Collection and study of higher fungi.
Sept. 6-Oct. 14	Mr. Ken Harrison, Canada Dept. of Agriculture	Same as above.
Sept. 10-14	Dr. Harry Thiers, San Francisco State College	Same as above.
Sept. 8-Oct. 14	Dr. Ronald Peterson, University of Tennessee	Same as above.
Sept. 9-Oct. 17	Drs. A. Smith and Mrs. Smith, University of Michigan	Same as above.
Sept. 9-Oct. 17	Dr. Roy Watling, Royal Botanic Gardens, Edinburgh, Scotland	Same as above.
Sept. 9-Oct. 17	Samuel Mazzer, Ann Arbor, Michigan	Same as above.
Sept. 20-Oct. 11	Dr. Orson Miller, Forest Disease Lab., Laurel, Maryland	Same as above.
Sept. 23-25	Dr. Peter Schütt and family, Germany	General tour of northern Idaho forest conditions.

Sept. 28

Following are names of personnel who attended a watershed management seminar conducted by Harold Haupt and Ed Burroughs of the Forestry Sciences Lab, Moscow, Idaho. The meeting included general discussion and tours of studies in progress.

O. Copeland	Ogden, Utah
H. Williston	Oxford, Miss.
R. Jorgenson	Missoula, Mont.
G. Clogett	Dillon, Mont.
D. Fandry	Butte, Mont.
C. Whitt	Missoula, Mont.
C. Hagedorn	Dillon, Mont.
L. Silvey	St. Maries, Idaho
A. Nousianen	Hamilton, Mont.
D. Carter	Lolo, Mont.
H. Powe	Great Falls, Mont.
B. Swift	Colville, Wash.
J. Hall	Kalispell, Mont.
J. Eggleston	Billings, Mont.
E. Reinsel	Grangeville, Idaho
J. Abbott	St. Joe, Idaho
O. Esterl	Coeur d'Alene, Idaho
G. Mueller	Libby, Mont.
F. Halle	Helena, Mont.
C. Harnish	Sandpoint, Idaho
R. Wheeler	Missoula, Mont.
L. Logan	Bozeman, Mont.

COOPERATION

National forest administration provided technical advice and assistance on engineering problems associated with maintenance of the water and sewer systems. Falls Ranger Station maintained experimental forest roads and administered timber sales. Joslyn Pole Company, Sandpoint, provided assistance for measurement of the Benton Spring snowcourse, and the weekly maintenance runs to Watershed Management Research field installations from mid-December through January.

A show-me trip was conducted on June 16 by Glenn Deitschman and Robert Pfister for Kaniksu personnel as well as other from the Regional Office and University of Idaho. The following individuals were familiarized with the history, active research program, and future objectives of the experimental forest operation:

C. Stillwell	Kaniksu S.O., Sandpoint
E. Kulhanek	" " "
J. Alley	R.O., Missoula
L. J. Lyon	INT, Missoula
R. Boyd	INT, Moscow
K. Hungerford	University of Idaho, Moscow
J. Hauer	Falls R.S., Priest River
F. R. Primozie	" " " "